Exhibit 16

Truckee River Operations Model

Selected TROA Operations

SELECTED TROA OPERATIONS

A computer simulation of Truckee River operations over a 100-year period is used in the revised TROA DEIS/EIR to compare potential hydrologic differences among the No Action Alternative (No Action), Local Water Supply Alternative (LWSA), and TROA Alternative (TROA). Because of the complexity and interrelationship of numerous operational provisions in TROA, it is difficult to track specific operations through the large data set generated by the Truckee River Operations Model (model). To assist the reader in interpreting the simulation, ten major operational provisions of TROA are illustrated using selected portions of the model data set to highlight key aspects that are too intricate to be discussed in Chapter 3. Because of the technical nature of this appendix, the overview of TROA and the other two alternatives in Chapter 2 should be read before proceeding with this appendix. Referenced sections as well as terms unique to the draft Agreement are presented in Appendix ___.

Operational provisions discussed herein are:

1) Release of Water Quality Credit Water to meet water quality flow targets

2) Flow in the Truckee River downstream from Derby Dam

3) Exchange of Fish Water, Fish Credit Water and Joint Program Fish Credit Water into Independence Lake

4) Establishment of Power Company M&I Credit Water storage

5) Establishment of credit water through retention of Fish Credit Water in storage

6) Establishment of Fish Credit Water by waiver of single purpose hydroelectric diversion

7) Exchange of credit water from Boca Reservoir to Stampede Reservoir by retaining water in Stampede Reservoir

8) Exchange involving Donner Lake storage and Joint Program Fish Credit Water

9) Exchange of Lake Tahoe Floriston Rate Water to regulate reservoir release

10) Diversion and bypass associated with hydroelectric power plant diversion dams

1) Release of Water Quality Credit Water to Meet Water Quality Flow Targets

In the model, Water Quality Credit Water (WQCW) is released from storage during June through September to maintain a flow of 275 cfs in the Truckee River at Sparks or to maintain a river inflow to Pyramid Lake of 135 cfs. When WQCW is insufficient to meet these targets, the model gradually reduces releases to mimic the pattern of natural flow. The following example compares flows with and without the release of WQCW from Stampede Reservoir and illustrates the gradual release of WQCW from June through August, when storage is exhausted.

June through August simulated flow and release data used in the following example were selected for hydrologic conditions corresponding to analysis year #31. Data from September are not presented because no WQCW remains in storage after August.

Example: Flow Targets and June-August Release of Water Quality Credit Water	WQ Target (cfs)	Flow (cfs)		
		June	July	August
No WQCW in Storage				
1 Total Stampede Release		78	166	148
2 Truckee River at Farad		239	225	209
3 Truckee River at Sparks	275	52	75	58
4 Truckee River Inflow to Pyramid Lake	135	44	59	54
WQCW in Storage				
5 Stampede Release of WQCW		223	131	56
6 Total Stampede Release		301	297	204
7 Truckee River at Farad Flow		461	356	266
8 Truckee River at Sparks Flow	275	275	206	115
9 Truckee River Inflow to Pyramid Lake	135	266	190	110

Line 5 reveals that the release of WQCW decreases from 223 cfs in June to 56 cfs in August. As a result, the 275 cfs target at Sparks is achieved only in June, while releases in July are reduced to 131 cfs in an effort to save some WQCW for release during the following month. During August, the release of WQCW is only 56 cfs (the remaining amount in storage) and the resulting Sparks flow is 115 cfs. The target of 135 cfs for inflow to Pyramid Lake is maintained through July, but by August, the inflow to Pyramid Lake drops to 110 cfs.

2) Flow in the Truckee River Downstream from Derby Dam

Truckee River water is diverted at Derby Dam through the Truckee Canal to serve Newlands Project irrigation water rights and M&I demand in the Fernley community, while water is passed through the dam (a) to serve Orr Ditch water rights between Derby Dam and Pyramid Lake and (b) for the benefit of Pyramid Lake fishes in the lower river and lake system.

The following example illustrates the relation among flow and diversions at Derby Dam, flow in the lower river, and inflow targets for Pyramid Lake. Inflow targets to Pyramid Lake are prescribed by flow regime selection criteria for the lower Truckee River (*See* Biological Resources in Chapter 3). Simulated flow data used in this example were associated with hydrologic conditions corresponding to those of analysis year #28.

Example: Lower Truckee River Flow	Average Flow (cfs)			
	February	March	April	May
1 River flow at Derby Dam	250	1818	951	877
2 Diversion from River to Truckee Canal	130	15	0	40
3 Diversion from Truckee Canal to Fernley	6	6	9	11
4 Flow passed to lower Truckee River at Derby Dam	114	1797	942	826
5 Inflow to Pyramid Lake	125	1817	945	800
6 Pyramid Lake Inflow targets	120	220	490	800

During February-April, tributary and groundwater accretion to the lower Truckee River increases river flow so that inflow to Pyramid Lake is slightly greater than the bypass through Derby Dam. During May, consumptive use by irrigation and M&I between Derby Dam and Pyramid Lake reduces inflow to Pyramid Lake to less than that released from Derby Dam.
Comparing Pyramid Lake inflow targets (line 6) to simulated inflows (line 5) indicates that all inflow targets are met or exceeded from February through May. In this example, the May Pyramid Lake inflow target is achieved by releasing Fish Water and Fish Credit Water at a rate of 311 cfs from upstream reservoirs.

3) Exchange of Fish Water, Fish Credit Water and Joint Program Fish Credit Water into Independence Lake

According to Section 5.B.7(h), Joint Program Fish Credit Water (JPFCW), Fish Credit Water (FCW), and Fish Water (FW) must be exchanged into Independence Lake, if requested by California Department of Fish and Game (CDFG) during certain conditions, to maintain fish passage into the reach of Independence Creek that enters Independence Lake. The following example illustrates such exchanges using simulated hydrologic data corresponding to the hydrologic conditions of analysis year #31, a year of less than normal runoff.

Example: Fish Water and Joint Program Fish Credit Water exchanged into Independence Lake	Units	Jul	Aug	Sep	Oct	Nov
Fish Water Exchange Operation						
1 Share of Ind. Lake Evap. Loss	ac-ft	0	1	7	2	1
2 Exchange into Ind. Lake	ac-ft	0	313	0	0	0
3 Release to Stampede after exchange	ac-ft	0	0	62	111	129
4 FW in Ind. Lake	ac-ft	0	312	243	130	0
JPFCW Exchange Operation						
5 Share of Ind. Lake Evap. Loss	ac-ft	0	81	59	19	5
6 Exchange into Ind. Lake	ac-ft	2,394	370	0	0	0
7 Release to Stampede after exchange	ac-ft	0	0	533	1,102	965
8 JPFCW in Ind. Lake	ac-ft	2,394	2,683	2,091	970	0
Fish Water and JPFCW Combined Operation						
Exchange into Ind. Lake	ac-ft	2,394	683	0	0	0
Release to Stampede after exchange	ac-ft	0	0	595	1,213	1,094
Independence Lake Operation With Exchange						
Storage	ac-ft	10,994	10,498	9,835	8,583	7,500
Lake Elev.	ft	6,939.61	6,938.83	6,937.79	6,935.78	6,933.99
Total Release	ac-ft	4,145	258	653	1,254	1,181
	cfs	67	4	11	20	20

Several characteristics of this operation are as follows:

1. During July, there is adequate JPFCW in Stampede Reservoir to accommodate the exchange. However, during August, JPFCW is insufficient and there is no FCW in storage, so FW is used to supplement the exchange.
2. From September through November, FW and JPFCW are released from Independence Lake and re-stored in Stampede Reservoir.

Lines 11 through 14 indicate the total storage and total release from Independence Lake during each month. End of August storage in Independence Lake is 10,498 acre-feet, essentially equal to the storage target of 10,500 acre-feet identified in Section 5.B.7(h)(2). Except for the release during July to supply Power Company's M&I demand, the releases are between the 2 cfs minimum (Regime #2 in Section 9.C.6(a)) and CDFG recommended flows (10 cfs during August/September and 20 cfs during October/November; *See* Table FLOW 3-1 in Chapter 3).

Following are additional characteristics of this operation:

1. The total amount of credit water exchanged into Independence by the end of August is 3,077 acre-feet; after evaporation loss, the total is reduced to 2,995 acre-feet. Though the exchange of 3,077 acre-feet appears to be in violation of Section 5.B.7(h)(3) that limits such exchanges to 3,000 acre-feet, evaporation loss kept the operation within the limit.

2. The release of FW and JPFCW from Independence Lake is not completed until the end of November. This violates Section 5.B.7(h)(4), which requires that all such exchange water be discharged by November 1. However, Section 9.F provides opportunities under certain conditions to adjust operations to comply with California Guidelines. The model is programmed to "make the judgment" under such conditions to relax the deadline so that releases from Independence do not exceed the preferred flow (20 cfs).

4) Establishment of Power Company M&I Credit Water Storage

Power Company M&I Credit Water (PCMICW) may be established (a term used in the draft Agreement to mean the initial collection of credit water in storage) in accordance with Sections 7.A.3 (changed diversion rights) and 7.B.2 (Privately Owned Stored Water; POSW) . The following example illustrates the establishment of PCMICW with three procedures: (1) retaining Floriston Rate Water (FRW) associated with changed diversion rights; (2) exchanging the release of POSW from one reservoir for the retention of water in another reservoir; and (3) re-storing the release of POSW from one reservoir in a downstream reservoir. This example uses simulated reservoir operation and water right data under conditions corresponding to September of analysis year #29.

Example: Power Company M&I Credit Water Establishment By Exchange and Use of Changed Diversion Rights	Units	Lake Tahoe (PCMICW)	Donner Lake (POSW)	Ind. Lake (POSW)	Stampede Res. (PCMICW)	Boca Res. (PCMICW)
1 Beginning-of-month storage	ac-ft	10	7,490	15,950	40,170	0
2 Releases without establishment of PCMICW[1]	cfs	270	6.6	2.0	110	211
3 Changed diversion rights available for establishing PCMICW	ac-ft	0	0	0	832	560
4 Consumptive use[2] portion of available changed diversion rights	ac-ft	0	0	0	520	350
5 Change in release in order to establish PCMICW	cfs	-3.5	+3.5	+6.9	-8.7	-5.9
6 Release with establishment of PCMICW[1]	cfs	266.5	10.1	8.9	101.3	196.4
7 End-of-month storage[3]	ac-ft	220	6,670	15,270	40,900	350
8 Target release range	cfs	75-150	5-10	2-10	45-100	----

[1]Total release of all classifications of water from storage, not just those noted in the column headings, are used to achieve Floriston rates.

[2] Only the consumptive use of any changed diversion rights may be used to establish credit water, based on the assumption that any non-consumptive diversion would return to the river and be available to supply other water rights. The DEIS/EIR analysis assumes that 62.5% of a water right (that historically supplied an irrigation diversion with return flow to the Truckee River upstream of Derby Dam) represents its consumptive use portion. Thus, for 832 acre-feet of changed diversion rights listed under Stampede and 560 acre-feet under Boca, the consumptive use portion is calculated as 520 and 350 acre-feet, respectively.

[3] Allocation of reservoir losses to classifications of water and storage is not presented in this table. An apparent mismatch in a storage balance does not indicate an error. Rather, it reflects the impact of reservoir losses.

Following is a description of simulated operations associated with the above table:

Donner Lake and Lake Tahoe: PCMICW is established in Lake Tahoe by exchanging POSW in Donner Lake with FRW scheduled to be released from Lake Tahoe. POSW released for this exchange (3.5 cfs) is used to achieve Floriston Rates, while FRW scheduled to be released from Lake Tahoe is reduced by 3.5 cfs, which amount is retained as PCMICW. The amount of water necessary for Floriston Rates is not changed. Also, stream flow in Donner Creek is enhanced – CDFG recommended flow is 10 cfs (see Table FLOW3-1).

Independence Lake: POSW is released from Independence Lake to enhance stream flow and establish PCMICW in Stampede Reservoir. Without this additional release, flow in Independence Creek would only achieve the minimum requirement of 2 cfs; with an increase of 6.9 cfs, the total flow is near the 10 cfs recommended by CDFG (See Table FLOW3-1). This release is then captured in Stampede Reservoir and stored as PCMICW.

Stampede Reservoir: Without establishment of PCMICW in Stampede Reservoir with changed diversion rights, Stampede Reservoir release would have been 110 cfs. With Sierra Pacific exercises its rights to 832 acre-feet of changed diversion rights, Stampede release is reduced by 8.7 cfs and 520 acre-feet of PCMICW are established in Stampede.

Boca Reservoir: Sierra Pacific owns 560 acre-feet of changed diversion rights that it could use to establish 350 acre-feet of PCMICW in Boca Reservoir. Such establishment would reduce scheduled releases from Boca Reservoir by 5.9 cfs. When combined with the reduced inflow from Stampede Reservoir (8.7 cfs) that would have been passed through Boca Reservoir to achieve Floriston Rates, the release from Boca Reservoir is reduced from 211 cfs to 196.4 cfs. [Note: The 350 acre-feet of Boca PCMICW could have been established in Stampede Reservoir by reducing the scheduled release even more; however, this would have reduced Stampede release below the 100 cfs preferred release (See Table FLOW 3-1). Since Boca was in no danger of spilling, PCMICW was stored in Boca to maintain the Stampede release.

5) Establishment of Credit Water through Retention of Fish Credit Water in Storage

Section 7.A.3(a)(3) provides that certain credit water categories may be established with the consumptive use portion of changed diversion rights for an equal amount of FW or Fish Credit Water (FCW). The rationale is that the amounts of FW and FCW that would be scheduled for release may be reduced by an amount equal to the water supplied by changed diversion rights that remains in the Truckee River and is allowed to flow to Pyramid Lake without diversion. In essence, the release that would otherwise be scheduled and released may be reduced in exchange for an equal amount of water that flows into Pyramid Lake.

- The following example illustrates such establishment using simulated release and storage data under conditions corresponding to a month when the target inflow to Pyramid Lake is 300 cfs and FCW must be released from Lake Tahoe in order to achieve that target.

Example: Water Quality Credit Water (WQCW) Establishment Through Retention of Fish Credit Water (FCW)	Units	Quantity
1 Changed diversion rights available to establish WQCW	ac-ft	1,550
2 Consumptive use portion of changed diversion rights[1]	ac-ft	970
3 Target Inflow to Pyramid Lake	cfs	300
4 Pyramid Inflow provided by other than FW, FCW and WQ rights	cfs	89
5 FCW or FW release from other reservoirs or to satisfy other criteria	cfs	130
6 Streamflow equivalent to consumptive use portion of WQ rights (line #2)	cfs	16
7 FCW Tahoe release required if consumptive use portion diverted from Truckee River[2] (#3 – [#4 + #5])	cfs	81
8 FCW Tahoe release required if consumptive use portion stays in Truckee River (#3 – [#4 + #5 + # 6])	cfs	65
9 Reduction in release attributable to consumptive use portion of WQ changed diversion rights (#7 – #8)	cfs	16
10 Rate for WQCW establishment based upon reduction in FCW release	cfs	16
11 FCW in Lake Tahoe at beginning of month	ac-ft	5,100
12 Total monthly reduction in FCW for FCW release (65 cfs, line # 8)	ac-ft	3,990
13 Total monthly reduction in FCW for WQCW Establishment (16 cfs, line # 10)		
	ac-ft	970
14 FCW in Lake Tahoe at end of month (#11 – [#12 + #13])	ac-ft	140
15 WQCW in Lake Tahoe at beginning of month	ac-ft	6,170
16 Total monthly establishment of WQCW (16 cfs, line #10)	ac-ft	970
17 WQCW in Lake Tahoe at end of month (#15 + #16)	ac-ft	7,140

[1] Consumptive use portion of Changed Diversion Rights was explained under Example No. 4.

[2] Release of FCW from Lake Tahoe does not contribute to the Minimum Release requirement (Section 9.C.2(a)).

Following is an explanation of the logic and analysis associated with each line of the example:

Lines 1 and 2: These two lines describe the Truckee River water supply associated with changed diversion rights that have been allocated for water quality purposes. The consumptive use portion on line 2 is the monthly amount of water that may be used to establish WQCW. In this example, WQCW is established in Lake Tahoe.

Lines 3, 4, 5, and 6: These lines list target inflow to Pyramid Lake and certain supplies that contribute to providing that inflow. The 16 cfs in line #6 is water that flows in the Truckee River only because the water rights have been dedicated to water quality purposes; when such water is left in the Truckee River, it flows to Pyramid Lake.

- Lines 7, 8, 9, and 10: These lines identify the water quality water that may be exchanged to establish WQCW in Lake Tahoe. Line 7 shows that, if the water quality water right supply were to be removed from the river, an 81 cfs release of FCW from Lake Tahoe would be made in order to supply the 300 cfs target inflow to Pyramid Lake (#7 = #3 – [#4 + #5] = 81 cfs). Line 8 shows that, when the water quality water right supply remains in the river (where it provides inflow to Pyramid Lake), a 65 cfs release of FCW from Lake Tahoe would be made in order to supply the 300 cfs target inflow to Pyramid lake (# 8 = #3 – [#4 + #5 + #6] = 65 cfs). Line 9 shows that when the water associated with water quality rights remains in the river, the reduction in required release of FCW from Lake Tahoe is equal to 16 cfs (#9 = #7 – #8 = 16cfs), which is equivalent to the consumptive use portion of WQ changed diversion rights (expressed in acre-feet on line 2 or as a release rate on line 6). Line 10 indicates that, because the reduction in required release of FCW from Lake Tahoe (line 9) is the same as the supply of inflow to Pyramid Lake provided by the water quality water rights (lines 2 and 6) and because the 65 cfs release of FCW from Lake Tahoe exceeds the 16 cfs attributable to WQ changed diversion rights in line 9, the 16 cfs may be exchanged to establish WQCW in Lake Tahoe.

- Lines 11, 12, 13 and 14 (storage in acre-feet): These lines list the month's storage accounting for FCW in Lake Tahoe. Line 11 shows the beginning of month amount of FCW in Lake Tahoe. Line 12 shows the total monthly release of FCW from Lake Tahoe, based upon the 65 cfs release on line 8. Line 13 shows the total monthly exchange from FCW to WQCW in Lake Tahoe, based upon the rate of WQCW establishment shown on line 10. Line 14 shows the end of month amount of FCW in Lake Tahoe (#14 = #11 – #12 – #13 = 140 acre-feet).

- Lines 15, 16 and 17: These lines list the month's storage accounting for WQCW in Lake Tahoe. Line 15 shows the beginning of month amount of WQCW in Lake Tahoe. Line 16 shows the total monthly establishment of WQCW in Lake Tahoe, based upon the rate of WQCW establishment shown on line 10. Line 17 shows the end of month amount of WQCW in Lake Tahoe (#17 = #15 + #16 = 7,140 acre-feet).

6) Establishment of Fish Credit Water By Waiver of Single Purpose Hydroelectric Diversion

Section 7.C.1 allows FCW to be established by retaining in storage FRW scheduled to be released solely to generate hydroelectric power pursuant to Claim Nos. 5 through 9 of the Orr Ditch decree. Under certain circumstances, up to one-half of this FCW would be designated as JPFCW (see Section 7.C.6). The following example illustrates such establishment using simulated release, credit establishment and streamflow data for December through February of analysis year #28.

Example: Establishing Fish Credit Water and Joint Program Fish Credit Water Using Waiver of Single Purpose Hydroelectric Water	Average Flow (cfs)		
	December	January	February
1 Release of FRW from Lake Tahoe			
FRW Release Without FCW/JPFCW establishment	100	151	158
FRW Release With FCW/JPFCW establishment	75	75	75
2 Rate of establishment of FCW/JPFCW in Lake Tahoe			
FCW	24	38	64
JPFCW	1	38	19
FCW and JPFCW combined	25	76	83
3 Rate of establishment of FCW/JPFCW in all reservoirs	165	134	90
4 Pyramid inflow with establishment of FCW/JPFCW	284	252	125
5 Pyramid Lake target inflow	120	120	120
6 Flow at Farad without establishment FCW/JPFCW	382	352	319
7 Flow at Farad with establishment of FCW/JPFCW	217	218	229
8 Floriston Rates (targets)	389	350	350

Following are the main considerations that control establishment of FCW and JPFCW in Lake Tahoe during these three months:

- Establishment of credit water in Lake Tahoe does not cause Lake Tahoe releases to drop below the enhanced minimum release of 75 cfs, which creates 25 cfs during December, 76 cfs during January, and 83 cfs during February.

- Establishment of FCW and JPFCW in all reservoirs does not cause the inflow to Pyramid Lake to drop below the target inflow of 120 cfs. Note that only February is limited by this restriction (February Pyramid inflow of 125 cfs approximates the target of 120 cfs). (The model recognizes actual operation will seldom match flow targets, so many of its calculations use a succession of calculations to approach the objective. After successive attempts, the model accepts a calculation that falls within an acceptable range, provided that Pyramid inflow is equal to or greater than the target inflow.)

- Establishment of FCW and JPFCW is based on Truckee River flow at Farad required to achieve Floriston Rates. Lines 6 through 8 list flows at Farad without establishment of FCW and JPFCW (line 6), flows with the establishment of such credit waters (line 7), and the Floriston Rate targets for each month (line 8). During December, the Floriston Rate drops from 400 cfs to 350 cfs (resulting in an average rate of 389 cfs for December) reflecting the drop in Lake Tahoe elevation below 6226.0 feet in December. During December and February, other types of credit water are being established which causes flows at Farad to drop by 7 cfs (389 – 382 = 7) in December and 31 cfs in February. (Also, during January the Farad flow (352 cfs) exceeds Floriston Rates (350 cfs) because there is spill of WQCW, which does not count as part of Floriston Rate supply.)

- The opportunity to establish FCW during these months is indicated by line 3. This line shows the sum of FCW and JPFCW established in Lake Tahoe during each of the months. Although JPFCW is entitled (Section 7.C.6(b)) to one-half of the total monthly establishment, JPFCW is allocated its full share (equal to one-half of establishment) only during January. During December, allocation to JPFCW is limited by the total annual establishment of JPFCW. During February, two considerations limit the allocation to JPFCW: total storage of JPFCW is approaching the limit of 20,000 acre-feet (Section 7.C.6(c)) and Prosser, Stampede and Boca reservoirs are nearly full, suggesting that spills may occur in the upcoming months and it would be prudent to hold off establishing JPFCW until after the spill season. In recognition of these factors, the model uses an evaluation procedure to limit establishment of JPFCW during February.

7) Exchange of Credit Water from Boca Reservoir to Stampede Reservoir by Retaining Water in Stampede Reservoir

Section 8.K.2(a) allows storage to be exchanged between two reservoirs by retaining water in storage in an upstream reservoir that would otherwise have been released or passed-through from the upstream reservoir and accumulated in a downstream reservoir. The following example (four tables) illustrates such an exchange of credit water from Boca Reservoir (the downstream reservoir) to Stampede Reservoir (the upstream reservoir) using simulated reservoir operation data under conditions corresponding to January of analysis year #80.

Storage amounts in Stampede and Boca reservoirs, before the exchange, are listed in the following tabulation.

Example: Initial Conditions During January Prior to the Exchange between Stampede and Boca

	Stampede Reservoir		
1	Maximum Storage (Flood control limit)	ac-ft	204,500
2	Start-of-Month Total Storage	ac-ft	156,340
3	Fish Credit Water	ac-ft	310
4	Power Company M&I Credit Water	ac-ft	41,460
5	California M&I Credit Water	ac-ft	0
6	Joint Program Fish Credit Water	ac-ft	30
7	Water Quality Credit Water	ac-ft	10,030
	Boca Reservoir		
8	Maximum Storage (Flood control limit)	ac-ft	32,900
9	Start-of-Month Total Storage	ac-ft	19,380
10	Fish Credit Water	ac-ft	0
11	Power Company M&I Credit Water	ac-ft	3,900
12	California M&I Credit Water	ac-ft	0
13	Joint Program Fish Credit Water	ac-ft	0
14	Water Quality Credit Water	ac-ft	280
	Truckee River (excluding Little Truckee River water)		
15	Farad Discharge	ac-ft	47,850
	Farad Flow	cfs	780
16	Diversion to Truckee Canal		0

Power Company M&I Credit Water (line 4) in Stampede has been adjusted for reservoir loss calculated for the month. Line 15 is the Truckee River flow at Farad (expressed both in acre-feet and cfs) if there is no discharge from the Little Truckee River (i.e. no release from Boca Reservoir). Line16 is the required diversion to the Truckee Canal to supply the Newlands Project. Since (a) the Newlands Project requires no pass-through from either Stampede or Boca reservoirs and (b) flow at Farad already exceeds Floriston Rates (which increase from 300 cfs to 400 cfs during the month), the two reservoirs can store all inflow as project water.

The next table (with lines 17 through 27) lists Stampede and Boca reservoir operations during January that would occur with no exchange of credit water.

Based upon the priority for storage of Boca Project Water, the credit waters stored in Boca Reservoir must make room for storing all inflow to Boca Reservoir. By removing credit water from the reservoir, Boca Reservoir can fill to 32,900 acre-feet (flood control storage limit) with Boca Project Water. Inflow to Stampede is 24,800 acre-feet (line 17), of which 14,330 acre-feet may not be stored and must pass through (line 19).

Example Continued: Stampede and Boca Operation Without Exchange

	Stampede Reservoir		
17	Stampede Reservoir Inflow	ac-ft	24,800
18	Stampede Reservoir loss	ac-ft	230
19	Stampede Release/Pass-Through	ac-ft	14,330
20	Stampede end-of-month storage	ac-ft	166,580
	Boca Reservoir		
21	Boca Reservoir Inflow from local basin	ac-ft	3,460
22	Boca Reservoir Total Inflow	ac-ft	17,790
23	Boca Reservoir Loss	ac-ft	90
24	Boca end-of-month storage	ac-ft	32,900
	Boca Reservoir Spill		
25	Total Spill	ac-ft	4,180
26	Power Company M&I Credit Water Spill	ac-ft	3,900
27	Water Quality Credit Water Spill	ac-ft	280

With the Stampede pass-through of 14,330 acre-feet and the Boca local basin inflow of 3,480 acre-feet (line 21), Boca Reservoir will fill to its limit of 32,900 acre-feet and spill 4,180 acre-feet (line 25), all of which would be credit water, as indicated on lines 11, 14, 26, and 27.

When Stampede passes through 14,330 acre-feet (line 19), the end-of-month Stampede storage is 166,580 acre-feet (line 20). If instead the Stampede pass-through is reduced by 4,180 acre-feet to 10,150 acre-feet and the 4,180 acre-feet of credit in Boca is transferred to Boca Project Water, the spill of credit water from Boca would be avoided. The Stampede portion of the exchange is as follows:

Example Continued: Stampede Operation and Exchange With Boca

	Stampede Reservoir Operation		
28	Stampede Reservoir Inflow	ac-ft	24,800
29	Stampede Reservoir loss	ac-ft	230
30	Stampede Reservoir Pass-Through	ac-ft	10,150
31	Stampede end-of-month storage	ac-ft	170,760
32	Exchanged Power Company M&I Credit Water from Boca	ac-ft	3,900
33	End-of-Month Power Company M&I Credit Water in Stampede	ac-ft	45,360
34	Exchanged Water Quality Credit Water from Boca	ac-ft	280
35	End-of-Month Water Quality Credit Water in Stampede	ac-ft	10,310
	Boca Reservoir Operation		
36	Boca Reservoir Inflow from local basin	ac-ft	3,460
37	Boca Reservoir Total Inflow	ac-ft	13,610
38	Boca Reservoir Loss	ac-ft	90
39	Boca end-of-month storage	ac-ft	32,900
40	Boca Reservoir Spill	ac-ft	0
41	Power Company M&I Credit Water Exchanged to Boca Project Water	ac-ft	3,900
42	End-of-Month Power Company M&I Credit Water in Boca	ac-ft	0
43	Water Quality Credit Water Exchanged to Boca Project Water	ac-ft	280
44	End-of-Month Water Quality Credit Water in Boca	ac-ft	0

With exchange of credit water in Boca to Boca Project Water, Stampede pass-through (line 30) is 4,180 acre-feet less than line 19 and, correspondingly, Boca total inflow (line 37) is 4,180 acre-feet less than line 22. This reduced inflow avoids spill from Boca (line 40).

The reduction in Stampede pass-through of 4,180 acre-feet is matched by the assignment to PCMICW and WQCW in Stampede of 4,180 acre-feet from Stampede inflow water (lines 32 and 34) that would have passed through Stampede Reservoir (line 19). The reduction in Boca inflow of 4,180 acre-feet is matched by the assignment to Boca Project Water of Boca water that would have spilled (lines 41 and 43).

8) Exchange Involving Donner Lake Storage and Joint Program Fish Credit Water

Under certain conditions, Section 8.Q.1 allows Sierra Pacific's POSW in Donner Lake to be exchanged with JPFCW. The following example illustrates this provision during a dry August that corresponds to hydrologic conditions (analysis year #90). This example presents data describing Sierra Pacific's demand, water supplies other than Donner Lake, impact upon Donner Lake if used to supply Sierra Pacific demand, and then, the example presents data to describe the use of a Section 8.Q.1-based exchange to supply Sierra Pacific demand while maintaining storage in Donner Lake. Data for this example are presented in three tables.

The first table lists M&I water demand by Sierra Pacific's customers and available water supply from Sierra Pacific's sources other than POSW and PCMICW.

Sierra Pacific's monthly M&I demand is 15,290 acre-feet (line 1). Groundwater pumping will supply 4,660 acre-feet (line 2) and Orr Ditch decree surface water rights will supply 6,000 acre-feet (line 6), for a total of 10,660 acre-feet. This leaves 4,630 acre-feet of M&I demand that cannot be supplied by the normal sources (line 7). During a dry year, it is anticipated that special water conservation actions would reduce demand by 1,070 acre-feet (line 8), leaving 3,560 acre-feet to be supplied (line 9).

Example: Sierra Pacific M&I Demand and Water Supply During A Dry August

1	M&I Demand - - Normal Year	ac-ft	15,290
	Supplies		
2	Groundwater Pumping	ac-ft	4,660
	Orr Ditch Decree Rights		
3	Hunter Creek Rights	ac-ft	220
4	40 cfs M&I Rights	ac-ft	2,430
5	Former Irrigation Rights	ac-ft	3,350
6	Subtotal of Supplies	ac-ft	10,660
7	Demand Not Supplied (#1 – #6)	ac-ft	4,630
8	Dry Year Conservation Reduction in Demand	ac-ft	1,070
9	Demand Not Supplied After Adjustment for Conservation (#7 – #8)	ac-ft	3,560

Section 7.B.3 requires that the next water supply upon which Sierra Pacific calls (after using supplies in the above tabulation) is its POSW. The next table illustrates an operation of Donner Lake that will supply Donner Lake POSW to Sierra Pacific and the use of other POSW supplies.

Lines 10 through 16 show Donner Lake operation with no exchange of JPFCW for POSW.

Example Continued: Sierra Pacific Use of POSW to Help Supply Demand During Dry August

	Donner Lake Operation Without Exchange		
10	Start-of-Month Donner Lake Storage	ac-ft	8,038
11	Inflow	ac-ft	180
12	Evaporation Loss	ac-ft	470
13	Release of non-Sierra Pacific water	ac-ft	184
14	Release of Sierra Pacific POSW	ac-ft	596
15	End-of-Month Storage	ac-ft	6,968
16	End-of-Month Lake Elevation	feet	5,932.8
17	Independence Lake POSW Release	ac-ft	2,757
18	Boca Reservoir POSW Release	ac-ft	207
19	Total Release of POSW	ac-ft	3,560

This release of water from Donner Lake is supplemented by release of POSW from Independence Lake and Boca Reservoir (lines 17 and 18). [Note: POSW in Boca Reservoir was accumulated during earlier months when water was released from Donner Lake to achieve the enhanced minimum.] The total release of POSW from Donner Lake, Independence Lake and Boca Reservoir is 3,560 acre-feet (line 19) and this supplies the water for M&I demand (line 9).

JPFCW stored in Stampede and Boca Reservoirs is about 5,900 acre-feet and 210 acre-feet, respectively. In accordance with Section 8.Q.1, this water may be exchanged into Donner Lake to reduce the Donner Lake release and maintain more water in Donner Lake. The model calculation of such exchange is summarized in the next table.

The model calculates an exchange of 299 acre-feet from Stampede Reservoir (line 20) and 172 acre-feet from Boca Reservoir to Donner Lake (line 21). These exchanges are matched by exchanging equal amounts of Donner Lake POSW to Stampede and Boca Reservoirs. The total amount of water exchanged into and out of Donner Lake is 471 acre-feet (line 22).

Example Continued: JPFCW Exchange to Minimize Donner Lake Release During a Dry August

	Exchange With Joint Program Fish Water	Unit	Quantity
20	Stampede Exchange of JPFCW to Sierra Pacific POSW	ac-ft	299
21	Boca Exchange of JPFCW to Sierra Pacific POSW	ac-ft	172
22	Donner Exchange of Sierra Pacific POSW to JPFCW	ac-ft	471
	Donner Lake Operation Using JPFCW Exchange		
23	Start-of-Month Donner Lake Storage	ac-ft	8,038
24	Inflow	ac-ft	180
25	Evaporation Loss	ac-ft	471
26	Release of non-Sierra Pacific water	ac-ft	184
27	Release of Sierra Pacific POSW	ac-ft	125
28	Total Donner Release	ac-ft	309
29		cfs	5
30	End-of-Month Storage	ac-ft	7,438
31	End-of-Month Lake Elevation	ft	5,933.37
	Other Release of POSW		
32	Independence Lake POSW Release	ac-ft	2,757
33	Stampede Reservoir POSW Release	ac-ft	299
34	Boca Reservoir POSW Release	ac-ft	379
35	Total Release of POSW	ac-ft	3,560

The resulting operation of Donner Lake is shown on lines 23 through 31. The exchange results in reducing the Donner Lake release to 309 acre-feet (line 28) or 5 cfs (line 29) and final Donner Lake storage of 7,438 acre-feet (line 30). Line 31 shows the end-of-month lake elevation corresponding to the storage of 7,438 acre-feet.

Donner Lake release of 5 cfs (line 29) is the enhanced minimum release target for Donner Lake. This limits the amount of exchange between JPFCW and Donner Lake POSW calculated for this particular month, i.e., a greater exchange would necessitate a smaller release.

The water exchanged into Stampede and Boca reservoirs is then released to serve the Sierra Pacific demand. Thus, release of POSW listed on lines 17 and 18 is supplemented by release of exchanged water listed on lines 20 and 21. The resulting releases of POSW from Independence Lake, Stampede Reservoir and Boca Reservoir are listed on lines 32, 33 and 34. Line 35 lists the total calculated release of POSW (line 27 + 32 + 33 + 34). The total release (line 35) matches the total release listed on line 19 and is sufficient to supply the Sierra Pacific demand (line 9).

9) Exchange of Lake Tahoe Floriston Rate Water to Regulate Reservoir Release

Section 8.S authorizes exchanges that will enhance stream flow in the Truckee River immediately downstream from Lake Tahoe or replace a portion of a high release from Stampede Reservoir that would otherwise be required to achieve target flows in the lower Truckee River. It provides that FRW stored in Lake Tahoe may be released in exchange for equal amounts of JPFCW, FCW, and FW stored in Stampede Reservoir; that is, FRW would be released from Lake Tahoe and flow as JPFCW, FCW or FW and an equal amount of these waters in Stampede Reservoir would be reclassified as Project Water In Another Reservoir dedicated to support Floriston Rate flows. The following example is based on operations during analysis year #25.

The first example presents a summary of Lake Tahoe and Stampede operations during April through October. Two detailed tables then illustrate operations for June, September, and October.

Example: Section 8.S Operation (Table 1 of 3)

	Flow (cfs)						
	Apr	May	Jun	Jul	Aug	Sept	Oct
Lake Tahoe Total Release	75	75	199	171	75	75	83
Section 8.S Portion of Release	70	70	160	0	0	0	0
Fish Credit Portion of Release	5	5	39	0	0	0	0
FRW Exchanged into Stampede	70	70	160	0	0	0	0
Stampede Total Release	195	63	125	45	42	77	171
Release of FRW	0	0	0	0	0	77	146
Exchange (to Credit) of FRW	0	0	0	0	0	74	0
Total Reduction in FRW	0	0	0	0	0	151	146

April and May: The Lake Tahoe management objective during April and May is primarily to achieve a minimum release of 70 cfs and secondarily an enhanced minimum release of 75 cfs. If not for Section 8.S, 70 cfs would be released from Lake Tahoe in exchange for water stored in Prosser Creek Reservoir and this 70 cfs would be added to the Tahoe-Prosser Exchange storage account in Prosser Creek Reservoir. Section 8.S changes the operation so that the 70 cfs is exchanged for FW in Stampede Reservoir and is added to Lake Tahoe FRW (Project Water in Another Reservoir) account in Stampede Reservoir. In addition to the 70 cfs released and exchanged in accordance with Section 8.S, 5 cfs of FCW is released from Lake Tahoe, providing a total release from Lake Tahoe of 75 cfs.

June: The Lake Tahoe release is 160 cfs in accordance with Section 8.S to help reduce the magnitude of FW and FCW release from Stampede Reservoir**.** The following tables illustrate this operation for three scenarios

.

Example: June Section 8.S Operation (Table 2 of 3)

Scenario 1: Operation That Would Not Achieve Pyramid Lake Inflow Targets

	Flow (cfs)
Lake Tahoe Release without Section 8.S	39
Section 8.S release	31
Total Tahoe release	70
Stampede release	30
Inflow to Pyramid Lake	176
Pyramid Lake inflow target	400
Target shortfall	224

Scenario 1 -- June releases and flows are listed for the condition when all mandatory operation objectives are satisfied except the 400 cfs target inflow to Pyramid Lake. Release from Lake Tahoe is 70 cfs (minimum release) of which 31 cfs is provided in accordance with Section 8.S (as discussed above for April and May). Release from Stampede is 30 cfs, the required minimum. With these releases, the inflow to Pyramid Lake would be 176 cfs, which is less than the target inflow to Pyramid Lake. To achieve a Pyramid Lake inflow of 400 cfs, it would be necessary to release another 224 cfs, as indicated by the "Target shortfall" line.

Scenario 2: Use of Stampede Water To Achieve Pyramid Lake Inflow Target

	Flow (cfs)
Lake Tahoe Release without Section 8.S	39
Section 8.S release	31
Total Tahoe release	70
Stampede release	254
Inflow to Pyramid Lake	400
Pyramid Lake inflow target	400
Preferred Stampede release	125
Amount release exceeds preferred	129

Scenario 2 – This illustrates an operation that increases Stampede release to achieve the target inflow to Pyramid Lake. The 224 cfs Pyramid target shortfall shown in Scenario 1 is eliminated by increasing Stampede Reservoir release from 30 cfs to 254 cfs. The preferred June release from Stampede Reservoir is 125 cfs, however, and the Stampede release of 254 cfs exceeds preferred release by 129 cfs.

Scenario 3: Using Section 8.S Exchange To Achieve Pyramid Lake Inflow Target

	Flow (cfs)
Lake Tahoe Release without Section 8.S	39
Section 8.S release	160
Total Tahoe release	199
Stampede release	125
Inflow to Pyramid Lake	400
Pyramid Lake inflow target	400

Scenario 3 – Lake Tahoe release is increased 129 cfs and Stampede release is reduced 129 cfs. This increases the Section 8.S release from Lake Tahoe to 160 cfs (31cfs as for the first two scenarios plus 129 cfs to keep Stampede release from exceeding the 125 cfs Preferred Release). The total Lake Tahoe release of 199 cfs is less than CDFG's recommended 300 cfs (See Table FLOW-3).

The resulting operation of Lake Tahoe and Stampede provides an accumulation in Stampede Reservoir of Lake Tahoe FRW at 160 cfs during June.

September and October: During September and October, it is necessary for Lake Tahoe to release FRW in order to supply Floriston Rates. Application of Section 8.S , which resulted in Lake Tahoe FRW being stored in Stampede, provides for the required release of FRW being available from Stampede Reservoir.

To illustrate September and October Section 8.S operation, the following tabulation highlights Lake Tahoe release, Stampede release and exchange of Floriston Rate storage during September and October from Table 1 above.

Example: Section 8.S Operation Release of Lake Tahoe Floriston Rate Water (Table 3 of 3)

	Flow (cfs)	
	September	October
Lake Tahoe Release of FRW	75	83
Stampede Release Release of FRW	77	146
Exchange (to Credit) of Floriston Rate Storage	74	0
Total Reduction in Floriston Rate Storage	151	146

Primary considerations that controlled September and October FRW release and credit establishment (based upon exchange with FRW) calculations by the model are as follows:

- Lake Tahoe release should supply at least the Enhanced Minimum Release of 75 cfs.
- Lake Tahoe FRW stored in Stampede Reservoir should be released by November 1 (Section 8.S.5).
- Release of FRW should be as uniform as possible during September and October.

With these considerations, the model schedules release of FRW from Stampede Reservoir at 151 cfs during September and 146 cfs during October. A scheduled release of FRW from Stampede, however, is subject to being allocated to establishment of credit water in Stampede, in this instance 74 cfs. This reduces the September Stampede release to 77 cfs. In this example, there is no credit establishment based upon the October release from Stampede and the October release of FRW from Stampede remains at 146 cfs.

10) Diversion and Bypass Associated With Hydro-Power Plant Diversion Dams

Section 9.E requires that hydropower plant diversion facilities bypass certain flows. The following example presents Truckee River flow, diversion and bypass for each diversion facility using model calculations corresponding to hydrologic conditions during July and August of analysis year #27 and January through March of analysis year #30.

Example: Operation, Diversion and Bypass for Truckee River Hydropower Plants

			Flow (cfs)				
		Diversion Right	Jul	Aug	Jan	Feb	Mar
	Truckee River at Farad Gage						
1	Total Truckee River Flow		527	511	319	291	461
2	Fish Water		0	63	55	0	94
	Farad Power Plant Diversion						
3	Total Truckee River Flow		527	511	319	291	461
4	Bypassed Fish Water		0	47	50	0	94
5	Total Diversion Bypass		150	150	150	291	150
6	Diversion to Hydropower Plant	400	400	361	169	0	309
	Fleish Power Plant Diversion						
7	Total Truckee River Flow		522	506	335	304	469
8	Bypassed Fish Water		0	47	50	0	94
9	Total Diversion Bypass		195	179	100	50	144
10	Diversion to Hydropower Plant	327	327	327	235	254	325
	Verdi Power Plant Diversion						
11	Total Truckee River Flow		522	506	346	313	474
12	Bypassed Fish Water		0	47	50	0	94
13	Total Diversion Bypass		123	107	100	50	144
14	Diversion to Hydropower Plant	399	399	399	246	263	330
	Washoe Power Plant Diversion						
15	Total Truckee River Flow		473	458	330	293	451
16	Bypassed Fish Water		0	47	50	0	94
17	Total Diversion Bypass		77	97	100	50	144
18	Diversion to Hydropower Plant	396	396	361	230	243	307

Lines 1 shows the total flow at Farad and line 2 the portion of such water that is FW released from storage. [Note: FW may be a pass-through at times and not a release from storage; such pass-through is not included in line 2.] When the FW release (line 2) is subtracted from the Farad Flow (line 1), the resulting flow is greater than Floriston Rates in July and March and less than Floriston Rates in August, January, and February.

Lines 3, 4, 5 and 6 show the diversion to Farad powerplant. In all months except February, the bypass flow is 150 cfs (the minimum Farad bypass used in the revised TROA DEIS/EIR operation studies). During February, all flow is bypassed because a diversion of 141 cfs that would occur with a bypass of 150 cfs (291-150 = 141) is too small for the powerplant to operate. The model calculates diversion only for power generation. In actual operation for the above condition, there would be a small Farad diversion for flume maintenance. Such diversion is limited by Section 9.E.1(a) to no more than 5 cfs when flows are as used in this example.

Lines 7, 8, 9, and 10 show the diversion to Fleish powerplant. The July and August diversions (line 10) are set as the plant diversion right of 327 cfs and all remaining Truckee flow is bypassed. The August FW release of 47 cfs has no impact upon the bypass because the diversion right is satisfied by FRW. During January, bypass flow is the sum of 50 cfs provided by FW release and the minimum bypass of 50 cfs in accordance with Section 9.E.2(b)(1). During February, when no FW is released, only 50 cfs of FRW release is bypassed because the Farad flow is less than Floriston Rates. During March, the Farad flow (minus FW) is greater than Floriston Rates and, in accordance with Section 9.E.2(a), all 94 cfs of FW release is bypassed. When FW is added to the minimum bypass of 50 cfs, the total March bypass is 144 cfs.

Lines 11, 12, 13, and 14 show the diversion to Verdi powerplant. Verdi plant bypass and diversion amounts are the same as those applied to Fleish power plant.

Lines 15, 16, 17 and 18 show the diversion to Washoe powerplant. Except for August, the Washoe powerplant bypass and diversion amounts are the same as those applied to Fleish power plant. In August, the 47 cfs of FW is added to the 50 cfs minimum bypass, and the combined bypass of 97 cfs limits the Washoe powerplant diversion to 361 cfs.